

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

91. (New) A wireless device with active and low power modes, comprising:

an oscillator that generates a first reference frequency and a second reference frequency that is lower than said first reference frequency;

a radio frequency (RF) transceiver that communicates with said oscillator and that transmits and receives RF signals;

a baseband processor (BBP) that communicates with said oscillator and said RF transceiver and that performs RF mixing; and

a shutdown module that shuts down said BBP and said RF transceiver in said low power mode and transitions from said first frequency to said second frequency when transitioning from said active mode to said low power mode, and that operates said BBP and said RF transceiver in said active mode and transitions from said second frequency to said first frequency when transitioning from said low power mode to said active mode.

92. (New) The wireless device of Claim 91 wherein said oscillator includes a first oscillator that generates said first reference frequency and a second oscillator that consumes less power than said first oscillator and that generates said second reference frequency.

93. (New) The wireless device of Claim 91 further comprising a medium access control (MAC) device that includes said shutdown module.

94. (New) The wireless device of Claim 92 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

95. (New) The wireless device of Claim 91 further comprising a voltage supply that supplies a first voltage level during said active mode and a second voltage level during said low power mode.

96. (New) The wireless device of Claim 95 wherein said voltage supply includes a first voltage supply that supplies said first voltage level and a second voltage supply that supplies said second voltage level.

97. (New) The wireless device of Claim 95 wherein said shutdown module transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

98. (New) The wireless device of Claim 91 wherein said RF transceiver includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

99. (New) The wireless device of Claim 91 wherein said BBP includes a second PLL, and wherein said shutdown module shuts down said second PLL during said low power mode and operates said second PLL during said active mode.

100. (New) The wireless device of Claim 96 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

101. (New) The wireless device of Claim 92 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

102. (New) A system comprising the wireless device of Claim 91 and further comprising a remote device that periodically transmits a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

103. (New) A wireless device with active and low power modes, comprising:

a voltage supply that supplies a first voltage level and a second voltage level that is less than said first voltage level;

a radio frequency (RF) transceiver that transmits and receives RF signals;

a baseband processor (BBP) that communicates with said RF transceiver and that performs RF mixing; and

a shutdown module that shuts down said BBP and said RF transceiver in said low power mode and transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and that operates said BBP and said RF transceiver in said active mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

104. (New) The wireless device of Claim 103 wherein said voltage supply includes a first voltage supply that supplies said first voltage level and a second voltage supply that supplies said second voltage level.

105. (New) The wireless device of Claim 103 further comprising a medium access control (MAC) device that includes said shutdown module.

106. (New) The wireless device of Claim 103 further comprising a first oscillator that communicates with said BBP and said RF transceiver, that receives said first voltage level and that generates a first reference frequency.

107. (New) The wireless device of Claim 106 further comprising a second oscillator that receives said second voltage level, that consumes less power than said first oscillator and that generates a second reference frequency.

108. (New) The wireless device of Claim 107 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

109. (New) The wireless device of Claim 103 wherein said RF transceiver includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

110. (New) The wireless device of Claim 103 wherein said BBP includes a second PLL, and wherein said shutdown module shuts down said second PLL during said low power mode and operates said second PLL during said active mode.

111. (New) The wireless device of Claim 104 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

112. (New) The wireless device of Claim 107 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

113. (New) A system comprising the wireless device of Claim 103 and further comprising a remote device that periodically transmits a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

114. (New) A wireless device with active and low power modes, comprising:

a first oscillator that generates a first reference frequency;

a second oscillator that generates a second reference frequency that is lower than said first frequency;

a first voltage supply that supplies a first voltage level to said first oscillator;

a second voltage supply that supplies a second voltage level that is less than said first voltage level to said second oscillator; and

a shutdown module that shuts down said first oscillator in said low power mode and transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and that operates said first oscillator in said active mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

115. (New) The wireless device of Claim 114 further comprising:

a radio frequency (RF) transceiver that communicates with said first oscillator and that transmits and receives RF signals; and

a baseband processor (BBP) that communicates with said first oscillator and said RF transceiver and that performs RF mixing, wherein said shutdown module shuts down said RF transceiver and said BBP during said low power mode and operates said BBP and said RF transceiver during said active mode.

116. (New) The wireless device of Claim 114 further comprising a medium access control (MAC) device that includes said shutdown module.

117. (New) The wireless device of Claim 114 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

118. (New) The wireless device of Claim 115 wherein said RF transceiver includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

119. (New) The wireless device of Claim 115 wherein said BBP includes a second PLL, and wherein said shutdown module shuts down said second PLL during said low power mode and operates said second PLL during said active mode.

120. (New) The wireless device of Claim 114 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

121. (New) The wireless device of Claim 114 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

122. (New) A system comprising the wireless device of Claim 114 and further comprising a remote device for periodically transmitting a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

123. (New) A wireless device with active and low power modes, comprising:

a first oscillator that generates a first reference frequency;

a second oscillator that generates a second reference frequency that is lower than said first reference frequency;

a first wireless device circuit that communicates with said first oscillator;

a second wireless device circuit that communicates with said second oscillator; and

a shutdown module that shuts down said first wireless device circuit and said first oscillator and operates said second oscillator and said second wireless device circuit during said low power mode, and that operates said first oscillator and said first wireless device circuit during said active mode.

124. (New) The wireless device of Claim 123 further comprising a medium access control (MAC) device that includes said shutdown module.

125. (New) The wireless device of Claim 123 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

126. (New) The wireless device of Claim 123 further comprising a voltage supply that supplies a first voltage level to said first oscillator and a second voltage level that is less than said first voltage level to said second oscillator.

127. (New) The wireless device of Claim 126 wherein said voltage supply includes a first voltage supply that supplies said first voltage level to said first wireless device circuit, and a second voltage supply that supplies said second voltage level to said second wireless device circuit.

128. (New) The wireless device of Claim 127 wherein said shutdown module transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

129. (New) The wireless device of Claim 123 wherein said first wireless device circuit includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

130. (New) The wireless device of Claim 123 wherein said first wireless device circuit includes at least one of a baseband processor (BBP) and/or a radio frequency (RF) transmitter.

131. (New) The wireless device of Claim 126 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

132. (New) The wireless device of Claim 123 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

133. (New) A system comprising the wireless device of Claim 123 and further comprising a remote device that periodically transmits a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

134. (New) A wireless device with active and low power modes, comprising:

a voltage supply that supplies a first voltage level and a second voltage level that is less than said first voltage level;

a first wireless device circuit;

a second wireless device circuit; and

a shutdown module that shuts down said first wireless device circuit and operates said second wireless device circuit in said low power mode and transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and that operates said first wireless device circuit in said active mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

135. (New) The wireless device of Claim 134 wherein said voltage supply includes a first voltage supply that supplies said first voltage level and a second voltage supply that supplies said second voltage level.

136. (New) The wireless device of Claim 134 further comprising a medium access control (MAC) device that includes said shutdown module.

137. (New) The wireless device of Claim 134 further comprising:

a first oscillator that communicates with said first wireless device circuit, that receives said first voltage level and that generates a first reference frequency; and

a second oscillator that receives said second voltage level, that communicates with said second wireless device circuit, that consumes less power than said first oscillator and that generates a second reference frequency.

138. (New) The wireless device of Claim 137 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

139. (New) The wireless device of Claim 137 wherein said shutdown module shuts down said first oscillator and operates said second oscillator during said low power mode and operates said first oscillator during said active mode.

140. (New) The wireless device of Claim 134 wherein said first wireless device circuit includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

141. (New) The wireless device of Claim 134 wherein said first wireless device circuit includes at least one of a baseband processor (BBP) and/or a radio frequency (RF) transmitter.

142. (New) The wireless device of Claim 135 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

143. (New) The wireless device of Claim 137 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

144. (New) A system comprising the wireless device of Claim 134 and further comprising a remote device that periodically transmits a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

145. (New) A wireless device with active and low power modes, comprising:

a first oscillator that generates a first reference frequency;

a second oscillator that consumes less power than said first oscillator and that generates a second reference frequency;

a first voltage supply that supplies a first voltage level to said first oscillator;

a second voltage supply that supplies a second voltage level that is less than said first voltage level to said second oscillator;

a first wireless device circuit that communicates with said first oscillator;

a second wireless device circuit that communicates with said second oscillator; and

a shutdown module that shuts down said first wireless device circuit and said first oscillator in said low power mode, operates said second wireless device circuit and said second oscillator in said low power mode and transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and that operates said first wireless device circuit and said first oscillator in said active mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

146. (New) The wireless device of Claim 145 wherein said first wireless device circuit further comprises:

a radio frequency (RF) transceiver that communicates with said first oscillator and said first voltage supply; and

a baseband processor (BBP) that communicates with said first oscillator and said first voltage supply and that performs RF mixing, wherein said shutdown module shuts down said RF transceiver and said BBP during said low power mode.

147. (New) The wireless device of Claim 145 further comprising a medium access control (MAC) device that includes said shutdown module.

148. (New) The wireless device of Claim 145 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

149. (New) The wireless device of Claim 146 wherein said RF transceiver includes a first phase locked loop (PLL), and wherein said shutdown module shuts down said first PLL during said low power mode and operates said first PLL during said active mode.

150. (New) The wireless device of Claim 146 wherein said BBP includes a second PLL, and wherein said shutdown module shuts down said second PLL during said low power mode and operates said second PLL during said active mode.

151. (New) The wireless device of Claim 145 wherein said first voltage supply includes a first voltage regulator and said second voltage supply includes a second voltage regulator.

152. (New) The wireless device of Claim 145 wherein said shutdown module selectively calibrates said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

153. (New) A system comprising the wireless device of Claim 145 and further comprising a remote device for periodically transmitting a beacon, wherein said shutdown module transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

154. (New) A wireless device with active and low power modes, comprising:

oscillating means for generating a first reference frequency and a second reference frequency that is lower than said first reference frequency;

transceiving means that communicates with said oscillating means for transmitting and receiving radio frequency (RF) signals;

processing means that communicates with said oscillating means and said transceiving means for performing RF mixing; and

shutdown means for shutting down said processing means and said transceiving means in said low power mode and transitioning from said first frequency to said second frequency when transitioning from said active mode to said low power mode, and for operating said processing means and said transceiving means in said active mode and transitioning from said second frequency to said first frequency when transitioning from said low power mode to said active mode.

155. (New) The wireless device of Claim 154 wherein said oscillating means includes first oscillating means for generating said first reference frequency and second oscillating means that consumes less power than said first oscillating means for generating said second reference frequency.

156. (New) The wireless device of Claim 154 further comprising a medium access control (MAC) device that includes said shutdown means.

157. (New) The wireless device of Claim 155 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

158. (New) The wireless device of Claim 154 further comprising supply means for supplying a first voltage level during said active mode and a second voltage level during said low power mode.

159. (New) The wireless device of Claim 158 wherein said supply means includes first supply means means for supplying said first voltage level and second supply means means for supplying said second voltage level.

160. (New) The wireless device of Claim 158 wherein said shutdown means transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

161. (New) The wireless device of Claim 154 wherein said transceiving means includes first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

162. (New) The wireless device of Claim 154 wherein said processing means includes second phase locking means for locking phase, and wherein said shutdown means shuts down said second phase locking means during said low power mode and operates said second phase locking means during said active mode.

163. (New) The wireless device of Claim 159 wherein said first supply means includes first voltage regulating means for regulating voltage and said second supply means includes second voltage regulating means for regulating voltage.

164. (New) The wireless device of Claim 155 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

165. (New) A system comprising the wireless device of Claim 154 and further comprising remote means for periodically transmitting a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

166. (New) A wireless device with active and low power modes, comprising:

supply means for supplying a first voltage level and a second voltage level that is lower than said first voltage level;

transceiving means for transmitting and receiving radio frequency (RF) signals;

processing means that communicates with said transceiving means for performing RF mixing; and

shutdown means for shutting down said processing means and said transceiving means in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and for operating said processing means and said transceiving means in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

167. (New) The wireless device of Claim 166 wherein said supply means includes first supply means for supplying said first voltage level and a second supply means for supplying said second voltage level.

168. (New) The wireless device of Claim 166 further comprising a medium access control (MAC) device that includes said shutdown means.

169. (New) The wireless device of Claim 166 further comprising first oscillating means for generating a first reference frequency, that communicates with said processing means and said transceiving means and that receives said first voltage level.

170. (New) The wireless device of Claim 169 further comprising second oscillating means for generating a second reference frequency, that receives said second voltage level and that consumes less power than said first oscillating means.

171. (New) The wireless device of Claim 170 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

172. (New) The wireless device of Claim 166 wherein said transceiving means includes first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

173. (New) The wireless device of Claim 166 wherein said processing means includes second phase locking means for locking phase, and wherein said shutdown means shuts down said second phase locking means during said

low power mode and operates said second phase locking means during said active mode.

174. (New) The wireless device of Claim 167 wherein said first supply means includes first regulating means for regulating voltage and said second supply means includes second regulating means for regulating voltage.

175. (New) The wireless device of Claim 170 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

176. (New) A system comprising the wireless device of Claim 166 and further comprising remote means for periodically transmits a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

177. (New) A wireless device with active and low power modes, comprising:

first oscillating means for generating a first reference frequency;

second oscillating means for generating a second reference frequency that is lower than said first frequency;

first supply means for supplying a first voltage level to said first oscillating means;

second supply means for supplying a second voltage level that is less than said first voltage level to said second oscillating means; and

shutdown means for shutting down said first oscillating means in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and for operating said first oscillating means in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

178. (New) The wireless device of Claim 177 further comprising:

transceiving means that communicates with said first oscillating means for transmitting and receiving radio frequency (RF) signals; and

processing means that communicates with said first oscillating means and said transceiving means for performing RF mixing, wherein said shutdown means shuts down said transceiving means and said processing

means during said low power mode and operates said processing means and said transceiving means during said active mode.

179. (New) The wireless device of Claim 177 further comprising a medium access control (MAC) device that includes said shutdown means.

180. (New) The wireless device of Claim 177 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

181. (New) The wireless device of Claim 178 wherein said transceiving means includes first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

182. (New) The wireless device of Claim 178 wherein said processing means includes second phase locking means for locking phase, and wherein said shutdown means shuts down said second phase locking means during said low power mode and operates said second phase locking means during said active mode.

183. (New) The wireless device of Claim 177 wherein said first supply means includes first regulating means for regulating voltage and said second supply means includes second regulating means for regulating voltage.

184. (New) The wireless device of Claim 177 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

185. (New) A system comprising the wireless device of Claim 177 and further comprising remote means for periodically transmitting a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

186. (New) A wireless device with active and low power modes, comprising:

first oscillating means for generating a first reference frequency;

second oscillating means for generating a second reference frequency that is lower than said first reference frequency;

first wireless circuit means for communicating with said first oscillating means;

second wireless circuit means for communicating with said second oscillating means; and

shutdown means for shutting down said first wireless circuit and said first oscillating means and operating said second oscillating means and said second wireless circuit during said low power mode and for operating said first oscillating means and said first wireless circuit during said active mode.

187. (New) The wireless device of Claim 186 further comprising a medium access control (MAC) device that includes said shutdown means.

188. (New) The wireless device of Claim 186 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

189. (New) The wireless device of Claim 186 further comprising supply means that supplies a first voltage level to said first oscillating means and a second voltage level that is lower than said first voltage level to said second oscillating means.

190. (New) The wireless device of Claim 189 wherein said supply means includes first supply means for supplying said first voltage level to said first wireless circuit, and second supply means for supplying said second voltage level to said second wireless circuit.

191. (New) The wireless device of Claim 190 wherein said shutdown means transitions from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode and transitions from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

192. (New) The wireless device of Claim 186 wherein said first wireless circuit includes first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

193. (New) The wireless device of Claim 186 wherein said first wireless circuit includes at least one of processing means for performing RF mixing and/or transmitting means for transmitting RF signals.

194. (New) The wireless device of Claim 189 wherein said first supply means includes first regulating means for regulating voltage and said second supply means includes second regulating means for regulating voltage.

195. (New) The wireless device of Claim 186 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

196. (New) A system comprising the wireless device of Claim 186 and further comprising remote means for periodically transmitting a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

197. (New) A wireless device with active and low power modes, comprising:

supply means for supplying a first voltage level and a second voltage level that is lower than said first voltage level;

first wireless circuit means for performing a first function;

second wireless circuit means for performing a second function;

and

shutdown means for shutting down said first wireless circuit means and operating said second wireless circuit in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and for operating said first wireless circuit means in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

198. (New) The wireless device of Claim 197 wherein said supply means includes first supply means for supplying said first voltage level and second supply means for supplying said second voltage level.

199. (New) The wireless device of Claim 197 further comprising a medium access control (MAC) device that includes said shutdown means.

200. (New) The wireless device of Claim 197 further comprising:

first oscillating means for generating a first reference frequency, that communicates with said first wireless circuit means and that receives said first voltage level; and

second oscillating means for generating a second reference frequency, that receives said second voltage level, that communicates with said second wireless circuit means, and that consumes less power than said first oscillating means.

201. (New) The wireless device of Claim 200 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

202. (New) The wireless device of Claim 200 wherein said shutdown means shuts down said first oscillating means and operates said second oscillating means during said low power mode and operates said first oscillating means during said active mode.

203. (New) The wireless device of Claim 197 wherein said first wireless circuit means includes a first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

204. (New) The wireless device of Claim 197 wherein said first wireless circuit means includes at least one of processing means for providing RF mixing and/or transmitting means for transmitting RF signals.

205. (New) The wireless device of Claim 197 wherein said first supply means includes first regulating means for regulating voltage and said second supply means includes second regulating means for regulating voltage.

206. (New) The wireless device of Claim 200 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

207. (New) A system comprising the wireless device of Claim 197 and further comprising remote means for periodically transmits a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

208. (New) A wireless device with active and low power modes, comprising:

first oscillating means for generating a first reference frequency;

second oscillating means for consuming less power than said first oscillating means and for generating a second reference frequency;

first supply means for supplying a first voltage level to said first oscillating means;

second supply means for supplying a second voltage level that is lower than said first voltage level to said second oscillating means;

first wireless circuit means for communicating with said first oscillating means;

second wireless circuit means for communicating with said second oscillating means; and

shutdown means for shutting down said first wireless circuit means and said first oscillating means in said low power mode, operating said second wireless circuit means and said second oscillating means in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode, and for operating said first wireless circuit means and said first oscillating means in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

209. (New) The wireless device of Claim 208 wherein said first wireless circuit means further comprises:

transceiving means that communicates with said first oscillating means and said first supply means for transmitting and receiving; and

processing means that communicates with said first oscillating means and said first supply means for performing RF mixing, wherein said shutdown means shuts down said transceiving means and said processing means during said low power mode.

210. (New) The wireless device of Claim 208 further comprising a medium access control (MAC) device that includes said shutdown means.

211. (New) The wireless device of Claim 208 wherein said first oscillating means includes a crystal oscillator and said second oscillating means includes a semiconductor oscillator.

212. (New) The wireless device of Claim 209 wherein said transceiving means includes a first phase locking means for locking phase, and wherein said shutdown means shuts down said first phase locking means during said low power mode and operates said first phase locking means during said active mode.

213. (New) The wireless device of Claim 209 wherein said processing means includes second phase locking means for locking phase, and wherein said shutdown means shuts down said second phase locking means during said low power mode and operates said second phase locking means during said active mode.

214. (New) The wireless device of Claim 208 wherein said first supply means includes first regulating means for regulating voltage and said second supply means includes second regulating means for regulating voltage.

215. (New) The wireless device of Claim 208 wherein said shutdown means selectively calibrates said second reference frequency of said second oscillating means using said first reference frequency of said first oscillating means before transitioning to said low power mode.

216. (New) A system comprising the wireless device of Claim 208 and further comprising remote means for periodically transmitting a beacon, wherein said shutdown means transitions said wireless device from said low power mode to said active mode prior to receiving said beacon.

217. (New) A method for operating wireless device with active and low power modes, comprising:

generating a first reference frequency and a second reference frequency that is lower than said first reference frequency;

transmitting and receiving RF signals using a radio frequency (RF) transceiver;

performing RF mixing using a baseband processor (BBP);

shutting down said BBP and said RF transceiver in said low power mode and transitioning from said first frequency to said second frequency when transitioning from said active mode to said low power mode; and

operating said BBP and said RF transceiver in said active mode and transitioning from said second frequency to said first frequency when transitioning from said low power mode to said active mode.

218. (New) The method of Claim 217 further comprising:

generating said first reference frequency using a first oscillator; and

generating said second reference frequency using a second oscillator that consumes less power than said first oscillator.

219. (New) The method of Claim 218 wherein said first oscillator includes a crystal oscillator and said second oscillator includes a semiconductor oscillator.

220. (New) The method of Claim 217 further comprising supplying a first voltage level during said active mode and a second voltage level during said low power mode.

221. (New) The method of Claim 219 further comprising:
transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and
transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

222. (New) The method of Claim 217 wherein said RF transceiver includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

223. (New) The method of Claim 217 wherein said BBP includes a second PLL, and further comprising shutting down said second PLL during said low power mode and operating said second PLL during said active mode.

224. (New) The method of Claim 218 further comprising selectively calibrating said second reference frequency using said first reference frequency before transitioning to said low power mode.

225. (New) The method of Claim 217 further comprising:
periodically transmitting a beacon; and
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.

226. (New) A method for operating a wireless device with active and low power modes, comprising:

supplying a first voltage level and a second voltage level that is lower than said first voltage level;

transmitting and receiving RF signals using a radio frequency (RF) transceiver;

performing RF mixing using a baseband processor (BBP);

shutting down said BBP and said RF transceiver in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and

operating said BBP and said RF transceiver in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

227. (New) The method of Claim 226 further comprising generating a first reference frequency.

228. (New) The method of Claim 227 further comprising generating a second reference frequency.

229. (New) The method of Claim 226 wherein said RF transceiver includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

230. (New) The method of Claim 226 wherein said BBP includes a second PLL, and further comprising shutting down said second PLL during said low power mode and operating said second PLL during said active mode.

231. (New) The method of Claim 230 further comprising selectively calibrating said second reference frequency using said first reference frequency before transitioning to said low power mode.

232. (New) The method of Claim 226 further comprising:
periodically transmitting a beacon; and
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.

233. (New) A method for operating a wireless device with active and low power modes, comprising:

- generating a first reference frequency using a first oscillator;
- generating a second reference frequency that is lower than said first frequency using a second oscillator;
- supplying a first voltage level to said first oscillator;
- supplying a second voltage level that is lower than said first voltage level to said second oscillator;
- shutting down said first oscillator in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and
- operating said first oscillator in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

234. (New) The method of Claim 233 further comprising:

- transmitting and receiving RF signals using a radio frequency (RF) transceiver;
- performing RF mixing a baseband processor (BBP); and
- shutting down said RF transceiver and said BBP during said low power mode and operating said BBP and said RF transceiver during said active mode.

235. (New) The method of Claim 234 wherein said RF transceiver includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

236. (New) The method of Claim 234 wherein said BBP includes a second PLL, and further comprising shutting down said second PLL during said low power mode and operating said second PLL during said active mode.

237. (New) The method of Claim 233 further comprising selectively calibrating said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

238. (New) The method of Claim 233 further comprising:
periodically transmitting a beacon; and
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.

239. (New) A method for operating a wireless device with active and low power modes, comprising:

generating a first reference frequency using a first oscillator for a first wireless circuit;

generating a second reference frequency using a second oscillator that is less than said first reference frequency for a second wireless circuit;

shutting down said first wireless circuit and said first oscillator and operating said second oscillator and said second wireless circuit during said low power mode; and

operating said first oscillator and said first wireless circuit during said active mode.

240. (New) The method of Claim 239 further comprising supplying a first voltage level to said first oscillator and a second voltage level that is less than said first voltage level to said second oscillator.

241. (New) The method of Claim 240 further comprising:

transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and

transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

242. (New) The method of Claim 239 wherein said first wireless circuit includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

243. (New) The method of Claim 239 wherein said first wireless circuit includes at least one of a baseband processor (BBP) and/or a radio frequency (RF) transmitter.

244. (New) The method of Claim 239 further comprising selectively calibrating said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

245. (New) The method of Claim 239 further comprising:
periodically transmitting a beacon; and
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.

246. (New) A method for operating a wireless device with active and low power modes, comprising:

supplying a first voltage level and a second voltage level that is lower than said first voltage level;

shutting down a first wireless circuit and operating a second wireless circuit in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and

operating said first wireless circuit in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

247. (New) The method of Claim 246 further comprising:

generating a first reference frequency using a first oscillator; and

generating a second reference frequency using a second oscillator that consumes less power than said first oscillator and that.

248. (New) The method of Claim 247 further comprising shutting down said first oscillator and operating said second oscillator during said low power mode and operates said first oscillator during said active mode.

249. (New) The method of Claim 248 wherein said first wireless circuit includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

250. (New) The method of Claim 248 wherein said first wireless circuit includes at least one of a baseband processor (BBP) and/or a radio frequency (RF) transmitter.

251. (New) The method of Claim 246 further comprising selectively calibrating said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

252. (New) The method of Claim 246 further comprising:
periodically transmitting a beacon; and
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.

253. (New) A method for operating a wireless device with active and low power modes, comprising:

generating a first reference frequency using a first oscillator;

generating a second reference frequency using a second oscillator that consumes less power than said first oscillator;

supplying a first voltage level to said first oscillator;

supplying a second voltage level that is lower than said first voltage level to said second oscillator;

shutting down a first wireless circuit and said first oscillator in said low power mode, operating a second wireless circuit and said second oscillator in said low power mode and transitioning from said first voltage level to said second voltage level when transitioning from said active mode to said low power mode; and

operating said first wireless circuit and said first oscillator in said active mode and transitioning from said second voltage level to said first voltage level when transitioning from said low power mode to said active mode.

254. (New) The method of Claim 253 wherein said first wireless circuit further comprises:

a radio frequency (RF) transceiver that communicates with said first oscillator and said first voltage supply; and

a baseband processor (BBP) that communicates with said first oscillator and said first voltage supply and that performs RF mixing, wherein said shutdown module shuts down said RF transceiver and said BBP during said low power mode.

255. (New) The method of Claim 254 wherein said RF transceiver includes a first phase locked loop (PLL), and further comprising shutting down said first PLL during said low power mode and operating said first PLL during said active mode.

256. (New) The method of Claim 254 wherein said BBP includes a second PLL, and further comprising shutting down said second PLL during said low power mode and operating said second PLL during said active mode.

257. (New) The method of Claim 253 further comprising selectively calibrating said second reference frequency of said second oscillator using said first reference frequency of said first oscillator before transitioning to said low power mode.

258. (New) The method of Claim 253 further comprising:
periodically transmitting a beacon;
transitioning said wireless device from said low power mode to said active mode prior to receiving said beacon.